

18 AUG 2003

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British Hang Gliding and Paragliding Association

BOARD OF INQUIRY REPORT

**Investigation of a hang gliding accident which occurred
at Harting Down, West Sussex on 4th April 2003,
in which the pilot was fatally injured**

Introduction

On 4th April 2003 the British Hang Gliding and Paragliding Association (BHPA) received reports of an air accident at South Harting in which the hang glider pilot suffered serious injuries and on 5th April 2003 it was reported to the BHPA that the pilot had died as a result of those injuries.

The BHPA is required by current European Legislation to carry out an investigation and report the findings via the Air Accident Investigation Branch of the Ministry of Transport. Under its delegated authority it convened a Board of Inquiry under President John Aldridge and members David Thompson and Jeff Hoer, with authority to investigate and submit a report to the Flying and Safety Committee (FSC) of the BHPA for ratification.

BHPA investigation serial number: IR 03/027

Résumé

On Friday 4th April 2003 two pilots holding Club Pilot ratings visited a hang gliding site at Harting Down in West Sussex with the intention of flying and another hang glider pilot joined them shortly after. A little after 3 p.m. one of these pilots was observed flying his Avian Amour hang glider above the hill at a height of about 12m on a heading away from the hill. The glider was heard to impact the hill and the pilot was found unconscious and still attached to his glider. The emergency services were called and the pilot was airlifted to hospital. He died early the following morning from his injuries.

This Document is confidential until ratified.

Date ratified by the BHPA Flying and Safety Committee: 19 June 2003

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Appendix B. Glider damage report

Appendix C. Photograph of impact area

THE STRUCTURE OF THE REPORT

The structure of this report conforms to that recommended in the BHPA Technical Manual and is intended to follow the principles pertaining to AAIB reports. It is divided into four sections plus the Appendices

Section 1 - Factual information

Section 2 - Analysis

Section 3 - Conclusions

Section 4 - Safety Recommendations

Date: 3 July 03

Signed: 

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SECTION 1 - FACTUAL INFORMATION

1.1 History of the flight

On Friday 4th April 2003 two hang glider pilots met in the Petersfield area and proceeded to a known north facing flying site at Harting Down. On arrival they assessed the flying conditions and observed model aircraft flying the site before deciding to fly themselves. While preparing their equipment they were joined by another, more experienced, hang glider pilot who also considered the conditions suitable for soaring flight. At about 2:55 p.m. one of the pilots launched while the others continued preparing their equipment. He was observed to encounter both thermal and dynamic lift and soared in front of the hill at up to about 400 to 500 feet above launch height in the immediate vicinity and in the area to the east of launch. One pilot saw the glider head back to the top of the hill about half a kilometre away and disappear from view; it did not reappear. This witness estimates the glider's height above the terrain at about 12m at that point. A walker had also been observing the glider in flight but her view was sometimes obstructed by trees. On walking back toward the launch point she saw the glider above her through the trees with the pilot appearing to kick his legs. Shortly after this she heard the glider impact and ran to see if she could assist.

She found the pilot lying under his hang glider in a face down position and he was unconscious. The point of impact was on a grassy area of the forward (north) facing, gentle slope of a feature known as Round Down and around 40m behind the trees bordering the edge of the down. These trees are 4m high and closely packed.

Initially the walker attempted to ensure the unconscious pilot's airway was unobstructed and then attracted the attention of one of the other pilots. The emergency services were notified via his mobile 'phone while the third pilot joined him and they both continued to assist the pilot. A helicopter arrived to take the injured pilot to hospital some 50 minutes after the call to the emergency services was made. The helicopter was landed well back on the Down and the pilot observed to one witness that the air he encountered was rough even back there. The pilot was operated on at the hospital but died during the night.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	1	-	-
Serious	-	-	-
Minor/None	-	-	-

1.3 Damage to the aircraft

The hang glider was slightly damaged. Both control frame sides were broken. The base bar was also bent as were both outer sail battens. It is not possible to say with certainty that the base bar was bent in the impact but it seems likely. The battens are more likely to have been bent when the glider was man-handled on site after the accident.

1.4 Other damage

There was no other damage.

1.5 Personnel information

The pilot was 51 years of age and held a hang gliding rating of Club Pilot (Tow) with a hill endorsement. He had been flying since summer 1998 and had a total of 42 hours experience, 25.5 hours of this on the Avian Amour and 8 hours in the current year. Although initially tow rated the pilot had gained the majority of his flying experience from hill launches. His logbook indicates that he was not satisfied with either his own standard of flying or with the performance of his glider.

1.6 Aircraft information

The aircraft was manufactured by Avian Hang Gliders Ltd in July 1993 and is the Amour 159 model with a mylar sail. This is the larger of the two sizes produced and appropriate for the pilot's clip-in weight. A BHPA certificate of airworthiness for type was issued for the standard sail model but not the mylar version of this hang glider. It is in good condition for its age. The manufacturer has stated that the use of mylar for the sail makes the correct profiling of the sail battens, particularly the inboard ones, important for ensuring pleasant handling characteristics. The pilot had recently obtained a batten profile plan from the manufacturer and his logbook indicates that his centre battens had been significantly misshapen. He reshaped them to the correct profile in February.

1.7 Meteorological information

1.7.1 General Conditions

The forecast was for a sunny day with moderate northerly winds. At the time of the accident the wind at 2000 feet was actually 020 degrees at 10 – 15 knots.

1.7.2 Localised Weather

At the accident site at the time of the accident there was little cloud and the wind was approximately 15 m.p.h and occasionally 20 m.p.h. from the north. The witness who was out walking described the wind as gusty but one of the two other hang glider pilots present described it as smooth. In the impact area there was virtually no wind but the tops of the trees at the front of the hill could be seen bending over.

1.8 Aids to navigation

Not applicable.

1.9 Communications

Not applicable.

1.10 Aerodrome and approved facilities

The area of Harting Down from which the pilot launched and that where he impacted are in the ownership of the National Trust. The local hang gliding club have an agreement with the owners for flying at the site and have used it for this purpose for around 20 years. It is not considered a difficult site to fly in conditions appropriate to hang glider flight and the basic BHPA rating of Club Pilot is deemed sufficient for a pilot with current flying experience. The site is 750 ft a.m.s.l. and considered usable in wind directions between 340 to 040 degrees with 010 degrees as the optimum. Soaring flight is usually made along the line of the Downs to the east of launch where there are a series of bowls and spurs which generate lift dependent on the actual wind direction and strength.

1.11 Flight recorders

Not applicable.

1.12 Wreckage and impact information

The point of impact was on Harting Down at OS grid SU 79996 18415. This is a smooth grassy area of gentle downslope with no obstructions other than the line of trees at the northerly (downslope) end. The area is known as Round Down and marked on OS maps as such. Impact was approximately half a kilometre to the east of the launch point and not in an approved landing area. Even if it were convenient and approved by the NT this area would not be considered suitable due to the possibility of turbulence associated with the line of trees at the front edge of the hill. The area in front of Round Down is a steep, wooded bowl which often generates good dynamic lift.

1.13 Medical and pathological information

The toxicology report shows no positive findings. The cause of death is given as being due to multiple injuries.

1.14 Fire

Not applicable.

1.15 Survival aspects

1.15.1 The pilot carried a rescue parachute which was correctly installed. His helmet does not have the recommended CE standard EN 966 but it remained in place and does not appear to have been damaged in the impact.

1.15.2 The pilot had placed the transit bag and packing for his hang glider in the lightweight rucksack which normally contained his harness when in transit. He then placed this on his back prior to getting into his harness, which resulted in him requiring assistance in getting the harness fully in place. This is an unusual but not unique way of carrying the glider packing but it can restrict the pilot's movement when attempting to get into the landing position.

1.15.3 There was a period of approximately 50 minutes between the notification call to the emergency services detailing the location and nature of the accident and the arrival of medical assistance.

1.16 Tests and research

Not applicable.

1.17 Organisational and management information

Not applicable.

1.18 Additional information

None.

1.19 Useful or effective investigation techniques

Not applicable.

SECTION 2 – ANALYSIS

2.1 The Board considered the weather conditions.

The conditions outlined in 1.7 above would be considered potentially ideal for both dynamic soaring and thermal flight by suitably qualified and experienced hang glider pilots. The wind strength prevailing in the area was sufficient for dynamic soaring and not close to the upper limits for such flight. The addition of thermal lift would have produced localized variations in both wind strength and the amount of dynamic lift; soaring pilots would need to be aware of these variations when deciding where to position their aircraft relative to the hill.

2.2 The Board considered the site.

The soarable ridge at Harting Down is irregular in both profile and planview. When close to the hill this would also have lead to localized variations in both the amount of lift available and the wind strength. Round Down, where the glider impacted, is not an area where any pilot with basic knowledge of the behaviour of airflow around obstacles would venture without sufficient height to clear those obstacles with a safe margin.

2.3 The Board considered the hang glider.

The mylar version of the Avian Amour was conceived as a high performance hang glider but only a couple of these were produced. Mylar is a material that is more resistant to the stretching that mellows the handling of many older high performance gliders but its use on king-posted model (like the Amour) has not been found to have negative safety implications. This has been confirmed for this particular glider by evaluating it on the BHPA test rig where the pitch response did not drop below the zero line at any speed i.e. it was not pitch negative. The Amour is not regarded as being "twitchy" in control or difficult to fly when tuned correctly. Age and condition of the sail usually helps in this respect and it is not unusual to find pilots with relatively low airtime flying them. A pilot such as this one, with less than 20 hours airtime at the time and whose logbook indicates poor landing technique, would not normally be advised to change to a mylar Amour. However this does not appear to be an accident resulting from a glider failing to respond as expected and the pilot had gained 25 hours experience on it by the time of the accident.

2.4 The Board considered the level and currency of flying experience of the pilot.

The pilot gained both his Elementary and Club Pilot qualifications in July and August 1998 but only gained another 13 minutes airtime that year. In 1999 he managed just over twelve and a half hours, dropped to nine hours in 2000, seven and a quarter in 2001 and just under 5 hours in 2002. This airtime would no doubt have been even sparser if the pilot had not gone on a number of flying holidays to places with reasonably consistent soaring conditions. It is not the sort of flying pattern that this Board would recommend nor consider to be compatible with safe flying. The pilot's own logbook contains many mentions of mishaps or untidy escapes from mishap at both launch and landing – as one would expect of someone who flew only occasionally. In 2003 up to the time of his accident the pilot appeared to be trying to improve his flying currency and had already accumulated over eight hours. He also planned to fly while spending a week in Scotland later in April despite having recently expressed doubts about his future in the sport.

2.5 The Board considered the method of stowing glider bag and packing.

Hang gliding harnesses are designed to afford pilots sufficient freedom of movement to carry out the repositioning that is necessary at launch, in flight and on landing. Any impediment to this movement may result in difficulty or delay in carrying out essential control movements. The pilot had re-assured a witness that his method of stowing his glider packing did not have this effect but we cannot be certain that it did not on this occasion. Shortly before impact the pilot was seen to be "kicking his legs behind him with some urgency" and this action is compatible with a pilot having difficulty getting his body upright for landing. Although the pilot is unlikely to have planned to land at the impact point he may well have realised that this had become inevitable and attempted to get into the normal landing position where the lower body will take the initial impact in a hard landing. It is not possible to say whether this would have had any effect on the pilot's survival when landing in an area of rotor.

SECTION 3 – CONCLUSIONS

The Board considered the general nature of the accident: an inexperienced pilot flying a site he was unfamiliar with and getting caught out in a position from which he was unable to penetrate out into clear air and where it was inadvisable to land. The land sloped down into a gully to his right but he appears to have flown a track which took him over the highest and most gently sloping section of the hill before encountering rotor behind a line of trees and impacting the ground violently in a horizontal or head down attitude.

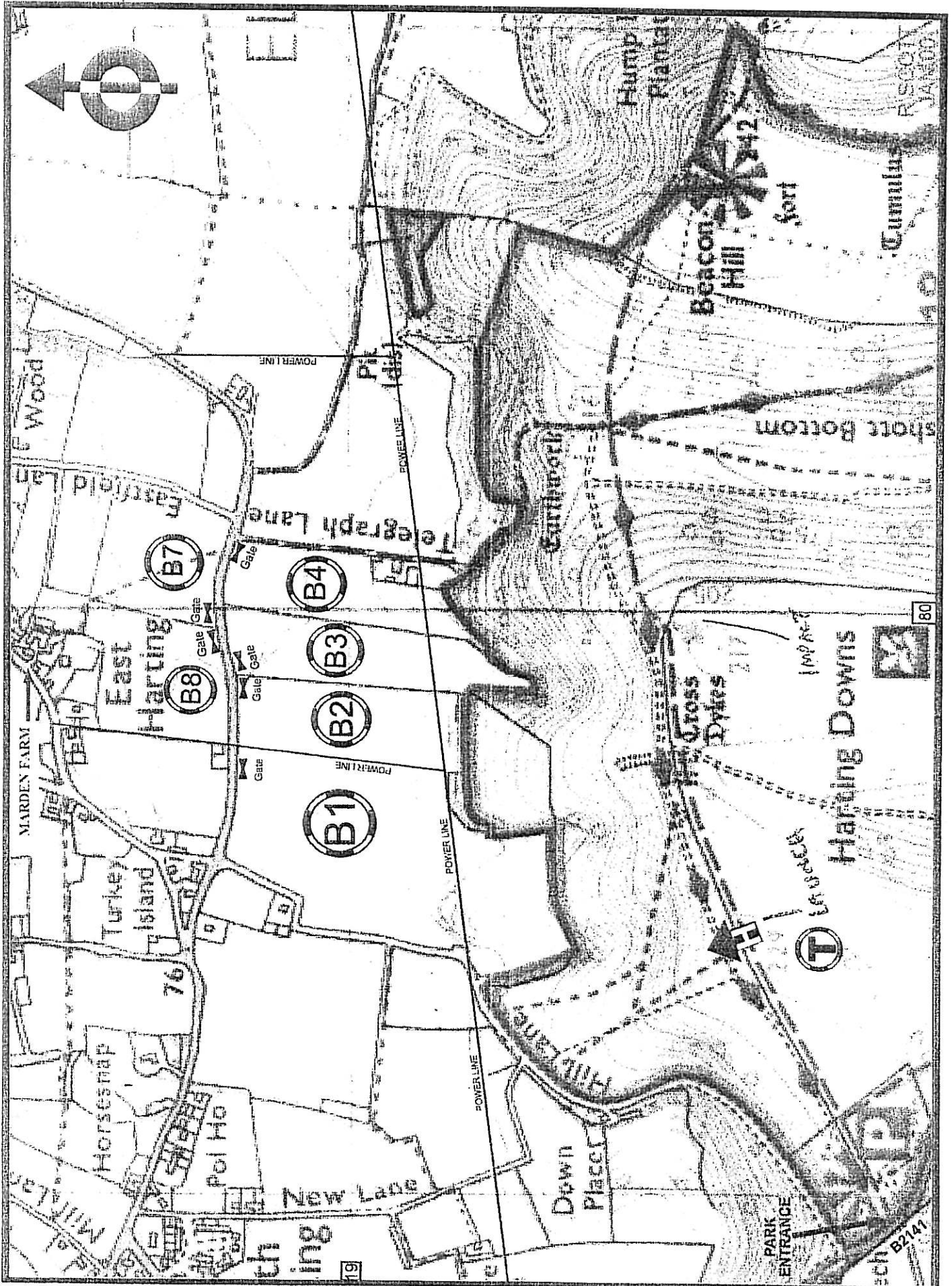
The Board concludes that the incident most probably occurred because the inexperienced pilot flew into an area of rotor with insufficient height to clear the obstacles causing that rotor. The Board also considers it possible that the positioning of the glider packing on the pilot's back inside his harness may have limited his movement and thus reduced his chances of surviving the impact.

SECTION 4 - SAFETY RECOMMENDATIONS

The Board recommends that the BHPA consider publishing advice to pilots about the stowage of glider packing and any other bulky items carried in flight.

HARTING

Appendix A



Equipment Details

Glider

Manufacturer: Avian Model: Amour

Details from keel sticker:

Amour Size 159 Serial 93159012 Max payload 96 kg, minimum 70 kg
CoA for type 9307093

Yellow Leading Edge, Pink U/surface, Green chevron forward underneath. 60 on left hand trailing edge. Sail is a lightweight mylar material.

Glider was removed from Brian by Tim King and moved (thrown?) to side or rear. It was subsequently moved to the top of Round Down by Dave Moy as a marker for the helicopter. Packed away by DM with assistance from TK and taken back to Brian's car by DM and strapped to rack. Car moved to Gary Cox's garden in South Harting by DM and Robbie Stokes – chairman of the Sky Surfing Club who had arrived on the hill after the arrival of the helicopter.

On opening the glider I found the uprights to be completely detached - as DM had told me. Both had been seriously bent just over half way up their length and by this stage one was only being held together by the rubber backing. The base bar was canted slightly forward at the ends and one pin and split ring were missing.

Both leading edges were bent but here was no other airframe damage and no sail damage that did not look like normal wear. The upright mouldings fixed to the keel were hard to swivel and I assume the heart bolt is bent – but did not remove it.

The batons had red and green tips to mark sides. Some had been repaired with sleeving and not all matched its opposite number. I did not have an Amour baton profile to check against. Details are:

No 1 (inner): red sleeved on cambered section and the green one was noticeably flatter in the cambered area.

No 2 - 6: both same camber, no damage.

No 7: green sleeved on straight section, red noticeably more cambered.

No 8: green sleeved on straight, camber matched.

Tip (straight) batons both bent, red more so. Green repaired.

2 hang loops with the blue, forward one being higher and presumably the main. This was fixed in such a way that it could easily move on the keel. There was no mark on the grip tape to indicate the preferred position.

The undersurface Velcro fastening was secure but not closed completely in that a portion of the Velcro was visible.

Steve Elkins, proprietor of Avian Ltd confirmed that the glider was made in 1993 (recorded as completed 10 July 1993) and had at least 2 other owners before Brian. Brian had purchased wires and luff lines from Avian and a baton profile in Feb of this year. Steve states that the profiling of the inner batons can make quite a difference to the handling on this type of glider – only a couple of which were made with the mylar sailcloth.

Harness

Badged as Sky Systems it is black and of the Pod type design where entry is usually made by the pilot stepping into the stop of the harness body and picking up the leg loops with the feet in the process. It has a front mounted reserve which I found in the normal place but with the undamaged bridle also loose in the container – which is consistent with Tim King's account of removing it to reduce pressure on Brian's chest area. There is a metal twin action towing release attached to the front of the harness above the parachute container. The rear had been slip open, the leg loop cut and the front body section of the harness, including parachute container, had been completely cut out by the medics. Suspension was by a robust hang loop and a lighter backup, plus 2 karabiners.

Although this type of harness has not been made for many years it was in good condition and the shoulder rope appeared to have been replaced recently.

Instruments

A Brauniger IQ Comfort alti/vario Serial No 0701 40298. Accessing memory mode shows that the last flight was on 4 April, max ht (A2) 521 ft (not sure if it was zeroed on the hill) and max ht amsl (A1) 396 ft (not sure of barometric pressure that day but it was high). Max speed 33 mph, max climb is 10 m/s and sink 15 m/s. The flight time is given as 1:46 indicating that the instrument was not switched off until the time Brian's kit was packed away.

Helmet

Lazer open face helmet. No visible sign of damage.

Appendix C



View north from point of impact